CLAIMS

WE CLAIM:

1. A gelled anode mixture comprising a metal alloy powder, a gelling agent, an alkaline electrolyte having a hydroxide concentration less than 40%, and at least one amphoteric surfactant.

2. A gelled anode mixture as claimed in Claim 1 wherein the amphoteric surfactant has a formula of Compound I.

3. A gelled anode mixture as claimed in Claim 2 further comprising an amphoteric surfactant having a formula of Compound II.

4. A gelled anode mixture as claimed in Claim 1 further comprising a surfactant having a general formula $Y\ SOx^-$.

5. A gelled anode mixture as claimed in Claim 4 wherein Y is selected from the group consisting of an alkyl group, an aryl group, an alkylaryl group, a carboxy acid group, and a salt of any of the foregoing.

6. A gelled anode mixture as claimed in Claim 4 wherein the $Y\ SOx^-$ surfactant is a salt of a sulfated octadecanoic acid.

7. A gelled anode mixture as claimed in Claim 4 wherein the $Y\ SOx^-$ surfactant is a sodium salt of sulfated oleic acid.

8. A gelled anode mixture as claimed in Claim 4 wherein the $Y\ SOx^-$ surfactant is selected from the group consisting of Witconate™ 1840X, Dyasulf 2031, Dymosol 2031, Freedom SOA-70, and Freedom SOA-70WV.

9. A gelled anode mixture as claimed in Claim 1 further comprising an organic phosphate ester surfactant.

10. A gelled anode mixture as claimed in Claim 9 wherein the organic phosphate ester surfactant is an ethylene oxide-adduct type organic phosphate ester.

11. A gelled anode mixture as claimed in Claim 9 wherein the organic phosphate ester surfactant is RM-510.

12. A gelled anode mixture as claimed in Claim 9 further comprising a surfactant having a general formula Y SOx^-.

13. A gelled anode mixture as claimed in Claim 12 wherein Y is selected from the group consisting of an alkyl group, an aryl group, an alkylaryl group, a carboxy acid group, and a salt of any of the foregoing.

14. A gelled anode mixture comprising a metal alloy powder, a gelling agent, an alkaline electrolyte having a hydroxide concentration less than 40%, wherein the metal alloy powder comprises zinc particles, at least 70% of the particles having a particle size within a 100 micron size range distribution, the distribution having a mode between about 100 and about 300 microns.

15. A gelled anode mixture as claimed in Claim 14 wherein the mode of the particle size distribution is about 100 microns.

16. A gelled anode mixture as claimed in Claim 14 wherein the mode of the particle size distribution is about 150 microns.

17. A gelled anode mixture as claimed in Claim 14 wherein the mode of the particle size distribution is about 250 microns.

18. A gelled anode mixture as claimed in Claim 14, wherein the electrolyte has an hydroxide concentration no higher than about 34%.

19. A gelled anode mixture as claimed in Claim 14, wherein the electrolyte has an hydroxide concentration no higher than about 30%.

20. A gelled anode mixture as claimed in Claim 14, wherein the electrolyte has an hydroxide concentration no higher than about 28%.

21. A gelled anode mixture as claimed in Claim 1, wherein the electrolyte comprises KOH.

22. An alkaline electrochemical cell comprising:

a positive current collector;

a cathode in contact with the positive current collector;

a gelled anode comprising a metal alloy powder, a gelling agent, an alkaline electrolyte having a hydroxide concentration less than 40%, and at least one amphoteric surfactant.;

a separator between the cathode and the anode; and

a negative current collector in electrical contact with the anode.

23. A alkaline electrochemical cell as claimed in Claim 22 wherein the amphoteric surfactant has a formula of Compound I.

24. A alkaline electrochemical cell as claimed in Claim 23 further comprising an amphoteric surfactant having a formula of Compound II.

25. A alkaline electrochemical cell as claimed in Claim 22 further comprising a surfactant having a general formula Y SOx^-.

26. A alkaline electrochemical cell as claimed in Claim 25 wherein Y is selected from the group consisting of an alkyl group, an aryl group, an alkylaryl group, a carboxy acid group, and a salt of any of the foregoing.

27. A alkaline electrochemical cell as claimed in Claim 25 wherein the Y SOx^- surfactant is a salt of a sulfated octadecanoic acid.

28. A alkaline electrochemical cell as claimed in Claim 25 wherein the Y SOx^- surfactant is a sodium salt of sulfated oleic acid.

29. A alkaline electrochemical cell as claimed in Claim 22 wherein the Y SOx^- surfactant is selected from the group consisting of Witconate™ 1840X, Dyasulf 2031, Dymosol 2031, Freedom SOA-70, and Freedom SOA-70WV.

30. A alkaline electrochemical cell as claimed in Claim 22 further comprising an organic phosphate ester surfactant.

31. A alkaline electrochemical cell as claimed in Claim 30 wherein the organic phosphate ester surfactant is an ethylene oxide-adduct type organic phosphate ester.

32. A alkaline electrochemical cell as claimed in Claim 30 wherein the organic phosphate ester surfactant is RM-510.

33. A alkaline electrochemical cell as claimed in Claim 30 further comprising a surfactant having a general formula Y SOx^-.

34. A alkaline electrochemical cell as claimed in Claim 33 wherein Y is selected from the group consisting of an alkyl group, an aryl group, an alkylaryl group, a carboxy acid group, and a salt of any of the foregoing.

35. An alkaline electrochemical cell comprising:

a positive current collector;

a cathode in contact with the positive current collector;

a gelled anode comprising a metal alloy powder, a gelling agent, an alkaline electrolyte having a hydroxide concentration less than 40%, wherein the metal alloy powder comprises zinc particles, at least 70% of the particles having a particle size within a 100 micron size range distribution, the distribution having a mode between about 100 and about 300 microns;

a separator between the cathode and the anode; and

a negative current collector in electrical contact with the anode.

36. A alkaline electrochemical cell as claimed in Claim 35 wherein the mode of the particle size distribution is about 100 microns.

37. A alkaline electrochemical cell as claimed in Claim 35 wherein the mode of the particle size distribution is about 200 microns.

38. A alkaline electrochemical cell as claimed in Claim 35 wherein the mode of the particle size distribution is about 300 microns.

39. A alkaline electrochemical cell as claimed in Claim 35, wherein the electrolyte has an hydroxide concentration no higher than about 34%.

40. A alkaline electrochemical cell as claimed in Claim 35, wherein the electrolyte has an hydroxide concentration no higher than about 30%.

41. A alkaline electrochemical cell as claimed in Claim 35, wherein the electrolyte has an hydroxide concentration no higher than about 28%.

42. A alkaline electrochemical cell as claimed in Claim 35, wherein the electrolyte comprises KOH.